REMARKS

Favorable reconsideration and allowance of the claims are respectfully requested in light of the following remarks.

Rejections Under 35 U.S.C. § 103(a)

A. Claims 20-30, 34-40, 48, and 49 over Ozaki in view of Rutz

In paragraph 4 of the Office action, the Examiner has rejected claims 20-30, 34-40, 48 and 49 under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,638,335 ("Ozaki") in view of U.S. Patent No. 5,154,881 (Rutz). This rejection is respectfully traversed for the reasons given below.

Claim 20 recites a process for preparing high density green compacts comprising the following steps: (a) subjecting a composition of a water-atomized, completely alloyed steel powder, wherein less than about 5% of the powder particles have a size below 45 μm, and a lubricant added to the powder in an amount between about 0.05% and about 0.6% by weight, to uniaxial compaction in a die at a compaction pressure of at least about 800 MPa; and (b) ejecting the green body from the die (emphasis added). Applicants respectfully submit that the combination of Ozaki and Rutz does not suggest the process of claim 20.

The process for preparing high density green compacts recited in claim 20 utilizes a composition of a water-atomized, completely alloyed steel powder, in which less than about 5% of the powder particles have a size below 45 μm. The claimed process uses a small amount of lubricant and a compaction pressure of at least about 800 MPa. The amount of fine particles in the composition controls the compressibility. The compacts have non-deteriorated surfaces. This result is in

contrast to known processes, and is obtained by using lower ejection forces. *See* page 5, lines 8-15, of the specification.

In the Office action dated January 24, 2008, the Examiner admits that Ozaki fails to disclose (1) ejecting the green body from the die, and (2) a composition formed from a water-atomized, completely alloyed steel powder. Nevertheless, the Examiner asserts that Applicants' claim 20 would have been obvious to one of ordinary skill in the art:

> However, the use of a completely alloyed powder would have been obvious to one of ordinary skill in the art as equivalent to the powder admixed with alloying elements as taught by Ozaki. For example, Rutz et al. discloses a process for die compaction of an iron based powder, and lists results from compacting Ancorsteel ® 4600 V powder (see Table 2). Rutz also teaches that the alloying elements of the iron powder are chosen to correspond to desired properties in the final metal part (see col. 3, lines 2-4). Rutz teaches that the iron based powder may be an admixture of iron and alloying elements, or a water-atomized, completely alloyed steel powder.
>
> It would have been obvious to one skilled in the art to use the completely alloyed steel as disclosed in Rutz et al., cited above, as the base composition of the iron powder used in the compaction steps disclosed in Ozaki et al. as an art-recognized equivalent (see Rutz et al., cited above).

Office action dated January 24, 2008, page 4.

Applicants submit that the Examiner has not articulated a valid reason why one skilled in the art would have combined the teachings of Ozaki and Rutz. The Examiner's allegation that Rutz somehow discloses that completely alloyed steel and unalloyed iron powder are art-recognized equivalents is unsupported by the facts. Rutz discloses metal powder compositions that contain a particular amide lubricant:

> The present invention provides methods for making sintered parts from a metal powder composition that contains an amide lubricant. The present invention also provides novel metal powder compositions that contain an iron-based powder and the amide

> lubricant, which is the reaction product of a monocarboxylic acid, a dicarboxylic acid, and a diamine.

Rutz, column 1, lines 54-60. It is in this context that Rutz states:

> The method and the composition are useful with any iron-based powder composition. By "iron-based powder" is meant any of the iron-containing particles generally used in the practice of powder metallurgy, including, but not limited to, particles of substantially pure iron, particles of iron in admixture with, for example, particles of alloying elements such as transition metals and /or other fortifying elements, and particles of pre-alloyed iron.

Rutz, column 1, line 65 to column 2, line 5. What Rutz discloses, then, is that either substantially pure iron, iron admixed with alloying elements, or pre-alloyed iron, can be used with the amide lubricant that forms the invention of Rutz. Rutz does not teach or suggest that substantially pure iron, iron admixed with alloying elements, and pre-alloyed iron are equivalents for all purposes, or even for all powder metallurgy processes. Rutz simply teaches that, for purposes of a process for making a sintered part using an amide lubricant, these different forms of powder can be used.

The Examiner's statement that Rutz discloses the equivalence of a water-atomized, completely alloyed steel powder to iron powders and iron powders admixed with alloying elements is also incorrect. Applicants have not been able to locate any portion of Rutz where a water-atomized powder is even mentioned, much less disclosed to be equivalent to other powders.

Applicants submit that, when Rutz is evaluated for what it actually discloses, it is apparent that one of ordinary skill in the art would not have had any reason to combine the teachings of Rutz with those of Ozaki. Ozaki does not use the amide lubricant that forms part of the invention of Rutz, but rather uses a conventional zinc stearate lubricant. *See* Ozaki at Table 2. Accordingly, one of ordinary skill in the art

would have had no reasonable expectation that the substitutability disclosed in Rutz would apply to the composition of Ozaki, given that the lubricant used in Ozaki is not the amide lubricant used in Rutz.

In addition, Ozaki is concerned with making parts having desirable magnetic properties. *See*, e.g., Ozaki at Examples 1-1, 1-2, 3-1, and 3-2. There is no disclosure in either Ozaki or Rutz that a pre-alloyed steel powder would be equivalent to the iron powders disclosed by Ozaki for this use.

Moreover, at column 3, lines 4-11, Ozaki describe the desired impurity contents of the iron powder to be used in the Ozaki process. This description excludes the composition of Ancorsteel ® 4600V disclosed at column 3, lines 19-24 of Rutz, and specifically relied upon by the Examiner in his Office action. If the primary reference expresses that a particular composition should be used, and that composition excludes the composition of the secondary reference, it is reasonable to conclude that one of ordinary skill in the art would be led away from combining the reference teachings. Applicants submit that this is the situation with the Ozaki and Rutz disclosures, and that one of ordinary skill in this art would have been taught by the reference teachings themselves to avoid making the combination that the Examiner suggests.

Even if the teachings of Ozaki were combined with those of Rutz, a *prima facie* case of obviousness would not exist because the claimed invention would not be obtained. The Examiner is not free to simply pick and choose convenient portions of Rutz and, with the use of hindsight and Applicants' claims as a template, combine only these teachings with certain teachings of Ozaki, while ignoring other teachings in Rutz. For example, the Examiner states:

> Applicant has argued that Rutz does not teach the claimed particle size distribution. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). While the examiner agrees Ozaki does not teach a completely alloyed steel powder, and Rutz does not teach the claimed particle size distribution, the combination of teachings of the prior art would have made this feature obvious as stated above.

Office action dated January 24, 2008, pages 11-12. However, Applicants have not merely argued the references separately, as the Examiner alleges.

Instead, Applicants argue that, even if one of ordinary skill in the art would have been motivated to combine the references as the Examiner alleges, the result would be the incorporation of the alleged pre-alloyed particles disclosed by Rutz in the process of Ozaki. After all, it is these particular pre-alloyed particles that the Examiner alleges are "equivalent" to the unalloyed iron particles that Ozaki is careful to use. Yet, when the pre-alloyed particles of Rutz are used, the result is not Applicants' claimed invention, because these pre-alloyed particles do not have the particle size distribution recited in Applicants' claims.

More specifically, the Examiner points to the Ancorsteel ® 4600V powder disclosed in Rutz. Applicants submit that this powder has a particle size distribution similar to that for Ancorsteel ® 1000 and Ancorsteel ® 85HP:

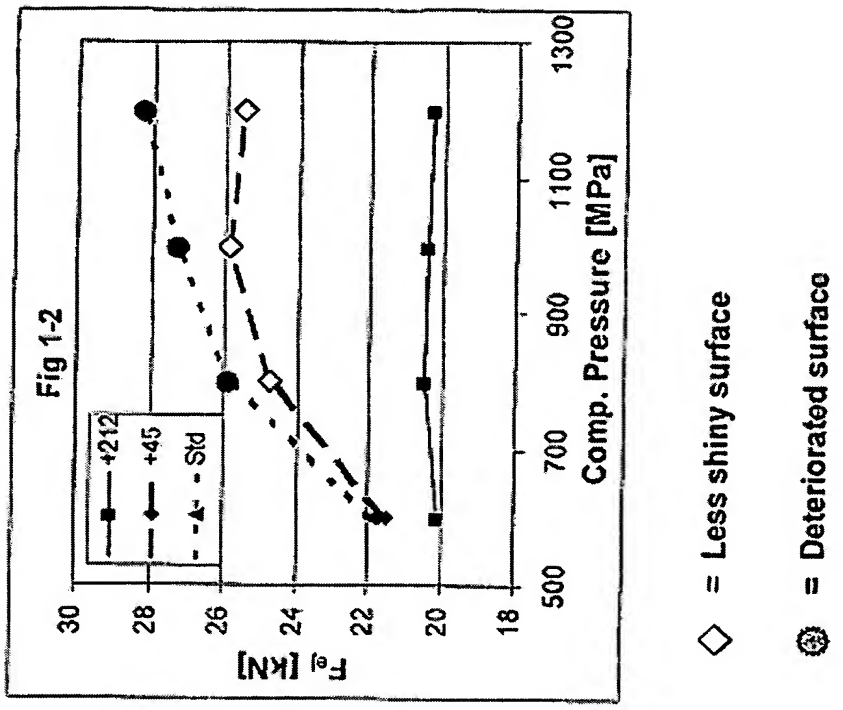
Size Range	Percentage
+250 µm	Trace
150 µm - 250 µm	10%
45 µm - 150 µm	70%
-45 µm	20%

If a worker of ordinary skill in this art were to combine the teachings of Rutz with those of Ozaki, this worker would incorporate into the Ozaki product particles having the particle size distribution disclosed in Rutz, and would not be led by any of the teachings in either reference to disregard this aspect of the Rutz disclosure (absent, of course, the Examiner's hindsight reconstruction of Applicants' claims). When this ordinary skilled worker incorporates the particular particles from Rutz (as the Examiner has suggested in the Office action) into the Ozaki material, he or she is incorporating a powder having a particle size distribution different from that of the claims. The result is not Applicants' claimed invention, and the Examiner has failed to establish a *prima facie* case of obviousness.

For at least the reasons given above, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. For this reason alone, the Examiner's rejection should be withdrawn.

Even if a prima facie case of obviousness could be said to exist, Applicants respectfully submit that it is rebutted by the evidence of unexpectedly different results shown in the specification and in the attached Declaration of Mr. Paul Skoglund, filed under 37 C.F.R. § 1.132.

As indicated above, the powders disclosed in Rutz do not possess the particle size distribution recited in Applicants' claims, but rather have the particle size distribution of a standard iron based metallurgical powder. Example 1 of Applicants' specification compares such a standard powder with powders prepared according to claim 20 when each are compacted into components. The ejection forces obtained for the compacted components are given in Figure 1-2, reproduced below:



The upper, short-dashed line represents the ejection forces for a standard powder particle size distribution while the middle, long-dashed line represents the ejection forces for a material made from the powder of the claimed invention, where less than about 5% of the powder particles have a size below 45 μm. As can be readily seen, the ejection forces needed for compacts produced according to the invention recited in claim 20 is considerably reduced when compared to that needed for the standard powder of the type disclosed in Rutz. In addition, the surfaces of the compacts produced at a compaction pressure above 700 MPa from the standard powder is deteriorated when compared to compacts produced according to claim 20. Applicants respectfully submit that these differences are not suggested by Rutz or Ozaki, and are therefore unexpected.

The Examiner's conclusion of obviousness is further rebutted by the Declaration of Mr. Paul Skoglund, submitted herewith. Applicants respectfully submit that this Declaration provides results of a comparison between the closest example of Ozaki and a powder composition of Applicants' claims, and shows that the results obtained for the force necessary to eject the formed product from a die is much lower when a powder is used that contains the features recited in Applicants' claims. This result is unexpected in light of the references cited by the Examiner, since, as the Examiner admits, Ozaki teaches nothing about ejecting the material formed from the powder.

B. Claims 20-25, 30, 34-40, and 48-49 over Rutz in view of Kondo

In paragraph 5 of the Office action, the Examiner has rejected claims 20-25, 30, 34-40, 48 and 49 under 35 U.S.C. § 103(a) as obvious over Rutz in view of U.S. Patent No. 3,901,661 (Kondo). This rejection is respectfully traversed for the reasons given below.

The Examiner asserts:

> Rutz teaches a process for preparing high-density green compacts (see Summary of the Invention, Detailed Description). Rutz teaches wherein the powder is a water-atomized, completely alloyed steel powder (see col. 3).

Office action of January 24, 2008, page 7. However, Rutz does not appear to mention water-atomizing.

The Examiner admits that:

> Rutz does not teach wherein less than about 5% of the powder particles have a size below 45 μm.

Office action of January 24, 2008, page 8. In an attempt to cure this deficiency, the Examiner cites Kondo, stating:

> Kondo teaches a water-atomized pre-alloyed steel powder (see abstract, cols. 7-8, claim 1). Kondo teaches that the particle size distribution of the steel powder is such that 2% of the [powder] is smaller than 325 mesh, thus meeting the limitation wherein less than about 5% of the powder particles have a size below 45 μm.

Office action of January 24, 2008, page 8. The Examiner concludes that:

> It would have been obvious to one of ordinary skill in the art at the time of invention to have practiced the method of Rutz while using the water-atomized, completely alloyed steel powder of Kondo, because Kondo teaches that compacts made from the powder will exhibit excellent hardenability and mechanical properties (see cols. 3-4).

Office action of January 24, 2008, pages 7-8.

Again, the Examiner has selectively chosen certain aspects of one reference to combine with another, while ignoring other aspects that do not support the rejection. The example in Kondo that allegedly discloses a particle size distribution having 2% of powder smaller than 325 mesh also includes 1% of a zinc stearate lubricant. If a worker having ordinary skill in this art were to think about combining the powder of Example 1 of Kondo with the disclosure of Rutz, this worker would reasonably expect to include not just the metal powder, but also the graphite and lubricant disclosed as also being present in the Kondo powder. Yet, doing so would destroy the invention of Rutz, which requires the presence of a particular amide-type lubricant, not zinc stearate. The Examiner does not explain why one of ordinary skill in the art would reasonably expect that the powder of Example 1 of Kondo would be effective in the powder compact disclosed in Rutz.

Even if the reference teachings were combined in the manner suggested, the invention of claim 20 would not be obtained. A worker of ordinary skill in the art would reasonably expect the powder from Kondo Example 1 to contain lubricant in an amount of 1% (because Example 1 of Kondo says so). This amount, whether the

lubricant is zinc stearate or an amide, is higher than the maximum recited in claim 20.

For either or both of the reasons given above, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness, and as a result, that this rejection should be withdrawn.

Finally, Kondo does not recognize any particular advantage to a particle size distribution having less than 5% of particles of a size below 45 μm. To the contrary, Kondo discloses two examples where the percentage of particles below 45 μm is not mentioned (Example 2) or where it is not less than 5% (Example 3). By contrast, the results disclosed in Applicants' specification and referred to above show that powders having particle size distributions as recited in claim 20 provide results that are unexpected when compared to the standard particle size distributions disclosed in Rutz. Accordingly, Applicants submit that any *prima facie* case of obviousness that might be said to exist over Rutz combined with Kondo has been rebutted. For this reason as well, Applicants submit that this rejection should be withdrawn.

For the foregoing reasons, allowance of the application is respectfully requested. Should there be any questions concerning this response, the Examiner is respectfully requested to contact the undersigned at the number given below.

Respectfully submitted,

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Date: June 23, 2008

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